



SCALE-UP D4.1 Intermediate Report on Implementation of data-driven strategies and tools

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SCALE-UP

User-Centric & Data Driven Solutions for Connected Urban Poles

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D4.1 – Intermediate Report on Implementation of data-driven strategies and tools

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List of Acronyms

Acronym	Meaning
APICS	Antwerp Port Community Information System
CDS-M	City Data Standard - Mobility
CRTM	Consortio Regional de Transportes de Madrid
EC	European Commission
EMT	Empresa Municipal de Transportes de Madrid
FUA	Functional Urban Area
GBFS	General Bikeshare Feed Specification
GDPR	General Data Protection Regulation
KPI	Key Performance Indicator
MaaS	Mobility as a Service
MDS	Mobility Data Specification
OCR	Optical character recognition
PT	Public Transport
RTS	Rail Traffic System
SRUMP	Sustainable Regional and Urban Mobility Plan
UI	User Interface
VSDS	Vlaamse Smart Data Space
WP	Work Package



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1 Executive Summary

This deliverable describes the background of the WP4 and how it relates to the different measures selected for implementation in SCALE-UP.

WP4 DATA explores the digital layer; one of the layers of the multi-layered mobility solution that is one of the foundations of SCALE-UP and is thus a key in the horizontal upscaling strategies that are the object of WP1. On the other hand, collection of data, processing of data, related processes such as operative interactions between stakeholders and service and data providers, securing and protecting private data, or how information is provided in the most meaningful and concise way to users are also aspects that are under the scope of WP4. And several of these aspects have relevance in almost all of the measures being implemented in SCALE-UP -not just those identified under WP4- which once again underlines the importance of the WP4 DATA concepts and adequate development within the project.

In general, all of the measures under WP4 are progressing adequately, being now in the early demonstration or final preparation phases. Perhaps the most interesting outcome of the implementation of the measures at this point is the identification of the different challenges and the different solutions that have been proposed by the cities to overcome these challenges.

As some of the challenges are of a technical nature, and others have more to do with organisational or operational aspects, cities are addressing both when approaching the challenges. The final goal will always be to raise awareness on the benefits of sharing data, and to provide the tools and mechanisms to ensure the quality, integrity and validity of data for the purposes of the measures being implemented.

With the WP4 measures being relatively advanced in implementation, local teams are getting a more accurate representation of what needs to be done to complete the implementation of the measures. The next steps described by the cities reflect this state, with actions being mostly focused on completing integration, completing acquisition of data sources, and advancing on standardisation, data processing and visualisation tools.



2 Introduction

The Work Package (WP) Data driven strategies and Tools aims to:

- Analyse and implement a data framework with new approaches for data capturing, advanced data analytics and business intelligence, through the development of data platforms and tools which ensure the availability, combination, integration and analysis of data.
- Translate regulatory frameworks into open data services that can be integrated by shared and Mobility as a Service (MaaS) mobility providers.
- Expand the data framework across the wider SCALE-UP urban areas.

WP4 includes 2 types of activities:

- 3 tasks for implementation of data-driven strategies and tools in each of the SCALE-UP cities (Antwerp, Madrid, Turku).
- 1 thematic cooperation task which has the main objective of providing the framework to exchange knowledge and build up capacity around the DATA intervention field between the 3 nodes while they are elaborating and implementing their measures.

The aim of this deliverable, its relation to other work packages and a brief outlook on the thematic cooperation is introduced in this chapter.

2.1 Content and aim of the deliverable

Deliverable D4.1 aims to show the implementation of activities and measures related to data-driven strategies and tools in the SCALE-UP urban nodes of Antwerp, Madrid and Turku. The measures specifically considered in SCALE-UP related to DATA are the following:

- A4 – NxT Mobility data strategy: management tool for multimodal mobility
- A5 – Towards a better intraport flow freight management by using smart data
- M4 – Data driven mobility management and MaaS in the Madrid metropolitan area
- T4 – Creating a mobility portal combining personal transportation and logistics
- T5 – Implementing a real time regional mobility data platform

This deliverable will present a brief overview of the current status of implementation for each of these measures. For this intermediate report, this status briefing includes the context and background of the measure, the current status itself followed by a description of the risks and challenges found in its implementation, some preliminary results if available, and finally what are the planned and expected activities in relation to the measure until its full implementation.

Chapter 3 of this deliverable will introduce each of the DATA measures with the outline suggested, while in Chapter 4, several conclusions are presented in relation to the DATA measures and their implementation progress.

2.2 Relation to other Work Packages & project activities

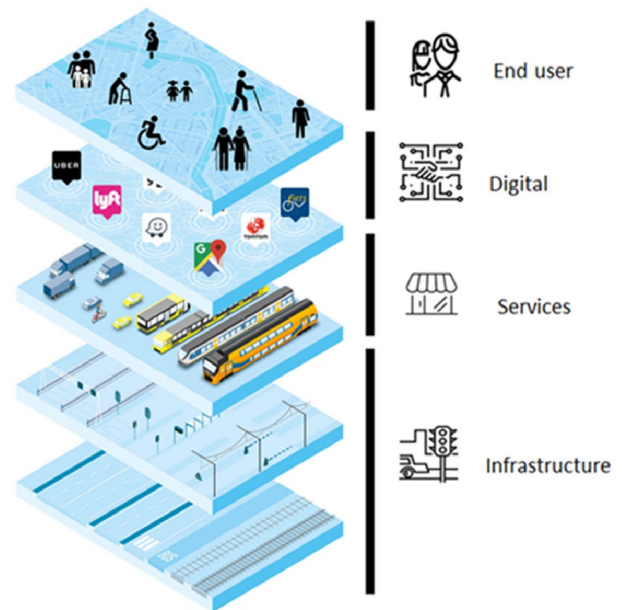
The DATA measures are related to the strategic objective O3 of SCALE-UP: 'To develop data driven mobility strategies and tools to stimulate seamless multimodal transport of passengers and freight and optimise network capacity across the functional urban area'.

SCALE-UP DATA measures were designed with the idea of following a data-driven strategy that would leverage data from public and private mobility providers to create a digital mobility layer. By means of data analytics and data sharing between the different actors in the urban nodes the project creates more efficient mobility, better connecting the sustainable mobility offer to the end user, as well as allowing for optimization of services, infrastructure and regulations.

WP4 is focusing on the creation and consolidation of a digital mobility layer which makes sense within the framework of a complete integrated multi-layer mobility system. Smart data or technologies are often regarded on one end as being a one-size-fits-all solution to urban mobility challenges, or on the other end as niche ad-hoc solutions for specific environments and problems. SCALE-UP approaches the multi-layer mobility solution in a way that the digital (DATA) layer being addressed by WP4

measures is considered with an equally strong infrastructure (transport network) and physical (services and end-users) layer.

It is from this perspective that WP4 is related with WP1 in its horizontal upscaling activities. DATA measures are one of the layers of the multi-layered mobility system, and arguably the one necessary link between existing infrastructure and transport network services with the wider-impact oriented efforts in SCALE-UP services and users layers. Feedback from the WP4 measures' implementation challenges, outcomes, lessons learned and in general their impact evaluation is feeding directly the WP1 strategies for horizontal up-scaling.



From the measures' perspective, and also again considering the concept of the digital layer as the 'backbone' of the multi-layer mobility system, WP4 measures and developments provide support to most of the measures in the other implementation WPs. Thus:

With WP2:

- A1 – Scaling up multilevel governance and cooperation to the Antwerp Transport Region (Functional Urban Area, FUA), with its stress on promoting cooperation between public and private stakeholders and the activities around the Roadmap 2030 data driven evaluation and monitoring.
- A2 – MaaS ecosystem and collaborative Governance Framework, which can be seen as the user-centric implementation of digitalising mobility paradigm, with a stress again on data-related processes for planning and policy design.
- M1 – Multilevel governance and stakeholder cooperation in Madrid metropolitan area, with its stress again on the multistakeholder cooperation for the implementation of Sustainable Regional and Urban Mobility Plan (SRUMP) and Madrid360 regional and urban sustainable mobility plans.
- T1 – Multilevel governance and cooperation to develop sustainable travel chains in the Turku region and Southwest Finland with its stress on

cooperation between different administrations and other stakeholders. Specific aims are aspects such as service procurement and service integration.

With WP3:

- A3 – Multimodal mobility hubs and network optimisations, in which the digital presence of the multimodal hubs is one of the key aspects considered. Planned within this digital presence are requirements such as support for route-planning and real-time mobility capacity assessment.
- M2 – Improving multimodal hubs with Park & Ride + public transport at regional level, with its requirements on standardised data for efficient and consistent data exchanges between the P&R facilities and the user mobility platforms.
- M3 – Fostering sustainable first and last mile logistics by mobility hubs, with two of its main objectives being the integration of freight mobility data into the mobility model of the city of Madrid, as well as the optimisation of processes in the sustainable mobility hub analysing the data on last mile logistics.
- T2 – Implementing mobility hubs in the Turku region, with its integration of data on mobility solutions, user services, and its intended direct link with WP4 T4 and T5 measures.
- T3 – Introducing MaaS ticket combos and adaptive parking in the Turku region, with its aim to integrate events, mobility and parking ticket solutions into a single comb, with the required cooperation between different stakeholders that that entails.

With WP5:

- A7 – Electric bike sharing for the Antwerp Transport Region, with its own data solution on accessibility and usage integrated in MaaS applications.
- A8 – Safe routing for freight transport including collection of freight data, with its core concept of a dynamic routing tool, and the required integration of data on the roads, city environment, multimodal freight network itself, etc.
- M6 – Promoting clean mobility (zero emissions) with supply/storage solutions, with its real-time integrated solutions for different personal mobility services and charging infrastructures.

With WP6:



- A9 – Nudging and incentivising sustainable travel, with its personalised mobility profile solution, based on collection of individual travel information and its implications for implementation of General Data Protection Regulation (GDPR) aspects.
- M8 – Nudging multimodality at regional level, with its solutions for providing information on alternative mobility modes for the users.
- T8 – Incentivization of mobility services in Turku, with its solutions for incentives and nudges based on service, user and stakeholder profiling and cooperation.
- T9 – Mobility guidance in connection with events and exceptional circumstances, squarely aiming at developing e-guidance solutions for specific situations.
- T10 – Winter as a mobility season, with its personalised targeting of user groups according to their mobility needs and preferences.

A special mention can be made to the relation between WP4 and WP2 Governance. Cooperation between public and private stakeholders and streamlining of operations and interactions for the many processes that could involve different stakeholders is a long-standing need for the mobility solutions. And there are of course two major sides to this cooperation: the formal, which is addressed by the WP2, and the technical, which is addressed by the WP4. However, strategies for designing, implementing and monitoring data exchange solutions within the scope of WP4 depend on decisions made at governance level, both in terms of funding, scope, impact and so on. This is why WP2 and WP4 have a particularly closed link, which should be explored and recognised in full in SCALE-UP.

2.3 Thematic cooperation

Following the methodology for data collection for SCALE-UP intervention areas defined by WP1, WP4 DATA carried out with the support of WP1 and WP8 the corresponding bi-lateral meetings with the 3 SCALE-UP cities and the subsequent thematic knowledge workshop.

The main objective of the bi-lateral meetings and the thematic knowledge exchange at this point was to collect information on the basic challenges that



each of the cities were facing when implementing the WP4 data measures, as well as the practices found to overcome those challenges.

Some of the findings from the thematic knowledge exchange meetings are:

- The major common issue with data measures is the reluctance from stakeholders to share information. The reasons stated being varied: privacy or data protection, disclosure of details about business model/application, unawareness of information being actually available as being outside the scope of the entity/individual...
- In the cases where there is an agreement to exchange data, lack of common formats, which in some cases is a consequence of different existing applications with different needs using -quite naturally- different data structures, is the challenge.
- In the three SCALE-UP nodes, administrative structures could be seen as having a direct impact on how data was managed.
 - Different governmental bodies that are all stakeholders. For example, Port of Antwerp, the Antwerp Transport Region and City of Antwerp being at different government 'levels' but having an implicit understanding of each other's needs and operation and working for common goals.
 - Multiple administration levels having responsibilities in part of the multimodal mobility network and services. E.g. Spanish national administration on long-distance modes, Madrid regional CRTM entity decision and planning over the region, including inter-municipalities, and Madrid city entities like EMT on city-level decisions. This makes integrated decisions more complicated from a formal point of view, even if all three administration levels agree on a common specific measure or goal.
 - Shifting competencies from level to level of the administration. Strategies for mobility can arguably be said to be implemented top-down, so we could be facing not only different competencies in transport for different administrations but in some cases shifting of competencies. E.g. Some local mobility functions are currently being shifted from city level to regional level. It should be noted that this is not simply a transfer of operations, but also of human resources, funding, and so on.

It is quite Interesting that in the three SCALE-UP cities, we have been able to see these three issues. The conclusion must be that data strategies seem to closely follow governance activities. And that therefore it could be interesting to make a specific link between WP2 and WP4 in order to make sure that needs on data measures' implementation in the cities are being considered in detail when making decisions on governance improvements.

The next steps for thematic cooperation, now that the measures are already entering the full implementation/early evaluation, is to organise a second round of bi-lateral meetings and thematic knowledge exchange. In this second round, it is expected that more details on the barriers encountered, in the shape of specific datasets or data exchange issues, whether there was any impact from (or to) the implementation of other WPs measures, and likely a first assessment of the results and impacts of the measures will be intended topics for discussion.

3 Context & status of the interventions

3.1 **A4 – NxT Mobility data strategy: management tool for multi modal mobility**

With the increase in mobility solutions and an explosion of the number of mobility providers, it has become more important than ever to be able to monitor the various solutions and validate that they contribute to the various goals a city/region has. It has also become more important to define clear boundaries to mobility providers to ensure both user and city benefit from the offering. To make sure that both monitoring and enforcing can be done, various data is required to be delivered by the mobility providers and tools are needed to analyse the data in a uniform way and make reporting/monitoring easy. The NXT Mobility management tool brings together the data, analysis and reporting.

3.1.1 Context

Data sharing is a balance between the various stakeholders. Making data sharing to third parties possible is costly, requires extra development and/or might reveal business intelligence that some stakeholders prefer to keep for themselves. Finding the right balance between how strict the sharing of data is defined, how hard a data standard needs to be pushed or how much detail can or should be shared has taken a lot of time to get clear.

An added challenge has been that the city of Antwerp uses data in various ways, therefore the need to clearly define data use cases has grown. Clearly defined data use cases make sure that all players involved in data sharing are aware of what can and cannot be done with the data. In the case of the city of Antwerp, some data (e.g. real-time availability) can be used to feed Smart ways to Antwerp the route planner and can be openly shared with third parties; other data can only be used for internal reporting and monitoring and can never be shared on provider level with third parties or the public.

3.1.2 Status

Since there is currently only a legal framework (through the operating licence) to obtain data from the various micro mobility providers, the focus has been on onboarding the data of these players and making sure the monitoring parameters

for those players are in place and functional within the management tool. The real-time data of all the shared scooter and moped providers has been onboarded and integrated not only in the management tool but also in the route planner and mobility map of Smart ways to Antwerp. The onboarding of the trip data has proven to be more challenging. The data standard used (MDS) is still evolving and some providers use different versions of this standards. The complete onboarding and integration of the trip data is therefore still ongoing. The goal is to have all current providers on board by the end of the year 2022.

While validating the first version of the mobility manager, it also became clear that the methodology used to calculate some of the parameters was showing a large deviation. Therefore, the calculation method was reviewed together with the providers to ensure it reflected more the situation on the ground.

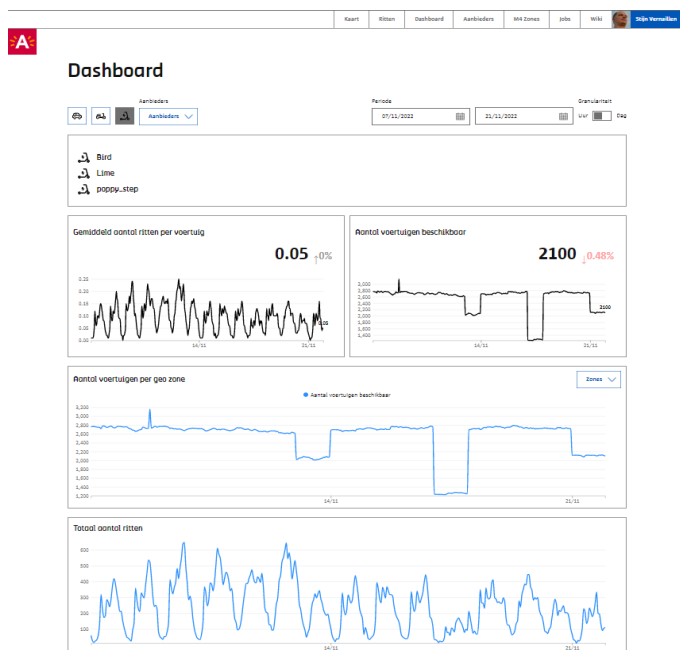
Another development was the addition of no-go and no-park zones to be able to better monitor these zones. This feature is still in acceptance and the definition of the various zones is still ongoing.

Donkey Republic, the bike sharing company active in the functional urban area (ref. measure A7) has not yet provided the necessary technical information to onboard the data and has therefore not yet been integrated in the manager, route planner or mobility map of Smart ways to Antwerp. The integration of this service is planned for Q4 of 2022.

3.1.3 Risks found and corrective actions performed

- There are various ways to calculate parameters like *average trips per vehicle* or *vehicles available*. It is important to understand that and be aware of the fact that there might be variations between the various calculation methods. To ensure correct calculation the city of Antwerp worked together with the stakeholders on defining a calculation method which is in-line with their expectations. Furthermore it should be noted that different cities use different calculations and therefore are not always comparable.
- Data streams can be unstable or measurements can be off. It is easy to monitor when a certain data stream is not available, it is harder to detect incomplete or faulty data. Some of the stability issues fall under the city's service level agreement with the mobility providers and the city can act upon those but most often, it is more a matter of keeping a clear head when analysing the results shown.





- Mobility providers encountered several issues with data sharing. Sometimes the cause was a lack of knowledge about the various data standards, other times there was a challenge because some specific data was not available. Through close collaboration with the various players, most challenges could be solved or cleared out. As an extra stimulus, the sharing of data has been made a requirement within the operating licence for shared mobility. A clear distinction has been made which data can be used publicly and which

data can only be used internally for monitoring. For other modes this has proven more difficult. There is close collaboration on a regional level to try to make data from the other modes more accessible through the Vlaamse Smart Data Space (VSDS, Flemish Smart Data Space). However, this is still in its early stage so it is still unclear when and how other data will be available.

- Local representatives of the various mobility providers often see the benefits of sharing data with the city of Antwerp but the global level is sometimes more reluctant to share data since it is not a country or EU wide requirement and every city has their own requirements.

3.1.4 Preliminary results

A first version of the mobility manager is operational and is used by the mobility department to check whether mobility providers comply with the agreed limitations like number of vehicles and spread of the vehicles. The platform is used to create uniform reports on performance of the integrated mobility providers.

Today all 3 of the shared scooter providers are integrated and two shared car providers. The integration of the shared moped provider is ongoing. Each of these providers have both a **General Bikeshare Feed Specification (GBFS)** and **Mobility Data Specification (MDS)** feed that are used by the mobility manager. The providers that only have a GBFS feed are not yet being integrated.

Based on the reporting it has already become clear that some of the providers are not meeting the required conditions defined in the operating licence. These providers have been confronted with the numbers. Currently no hard measures have been taken for not meeting the conditions. However, the expectation is that in Q4 2022 the first sanctions will be implemented.

As a result of the onboarding of the data, it is now also possible to open the data to third parties (only academic or governmental, not commercial) through the API-store of the City of Antwerp.

3.1.5 Next steps

- Onboarding of the data of Donkey Republic and the integration of this data in the mobility manager, route planner and mobility map of Smart ways to Antwerp.
- Defining and documenting the various data user stories more clearly and unified based on City Data Standard— Mobility criteria identified in CDS-M.com.
- Further development of functionalities related to no-go and no-park zones, comparing of different periods, calculating KPIs and visualisation on a map.

3.2 A5 – Towards a better intraport flow freight management by using smart data

The goal of this measure is to improve the efficiency of the intraport flows of freight (and passenger) traffic by using data. The measure consists of a four-steps approach:

- Collecting data – same format
- Bringing the data together – platform
- Visualising the data – barometer
- Using the data – management tool

3.2.1 Context

Almost 1.000 barges call the Port of Antwerp-Bruges on a weekly basis, every day 130 trains enter or leave the port area and several thousands of trucks visit the port terminals every day. Next to this about 60.000 people commute on a daily basis from and to the port area.

This results in important transport flows in and around the Port of Antwerp-Bruges and the city of Antwerp. In order to guarantee the accessibility of the port and the port terminals an efficient flow management of these transport moves is crucial.

3.2.2 Status

Depending on the mode of transport more data was, before the start of SCALE-UP, already used to manage the transport flows (see figure below). The goal is to systematically move up each mode to the next phase.

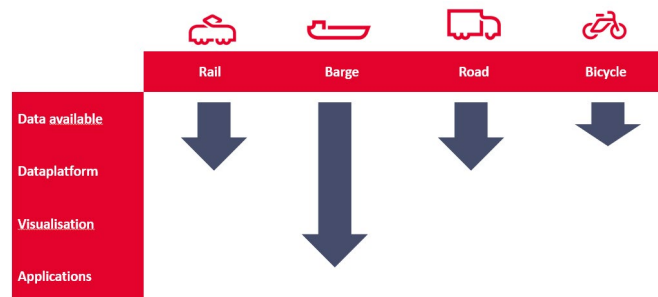


Figure 2. Modes of transport current status.

3.2.3 Risks found and corrective actions performed

The main risk within this task is to use the right data technology for the right goal and to get the data correct and interpreted in the right way by the data users. In order to mitigate this risk, it is important to spend enough time and energy on the selection of the right data technology. Next to this a clear and transparent visualisation of the data contributes to a non-ambiguous interpretation of the data.

3.2.4 Preliminary results

Most of the sub projects within this task are ongoing. For rail this means that following items are being set up:

- Optical character recognition (OCR) cameras to get a view on the incoming and outgoing trains

- A data warehouse for the Rail Traffic System (RTS)
- A dashboard to follow up the waiting times at the Zandvliet and Berendrecht locks.

For barges the focus is on getting insight on the occupation of berths in the port area. This will make it much easier for barges to find an available place and will reduce redundant trips. For this goal a dashboard is being set up and data is introduced in the Antwerp Port Community Information System (APICS) Barge tool (the unique platform for inland navigation in the port).

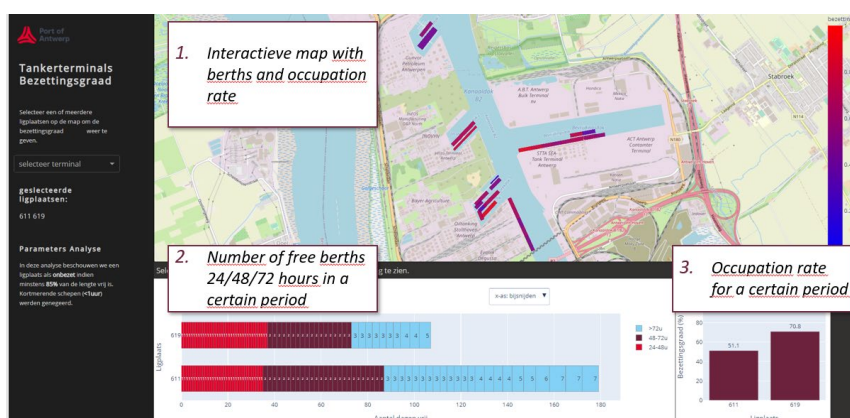


Figure 3. View on the Barge tool.

The road data platform is under construction and the first tests will be scheduled shortly. A use case for an on call truck parking system is being implemented by a port terminal.

The actions concerning cycling data are on hold. The Port of Antwerp-Bruges launched a € 40 million cycling infrastructure master plan in 2021 and the focus is on implementing this plan first.

3.2.5 Next steps

The next steps mainly focus on further developing the different modes of transport and their respective data tools.

3.3 M4 – Data driven mobility management and MaaS in the Madrid metropolitan area

From its creation, CRTM, who is the leader of this measure, has been working on a strategy based on a client-oriented approach locating users at the centre of its decisions, creating a public transport system of high quality for all the users, and adapted to their necessities – a strategy that is perfectly aligned with the new tendencies in mobility, the MaaS approach. Within this measure Madrid partners are studying and testing how different MaaS approaches, and solutions will help to address different challenges related to mobility management.

3.3.1 Context

Measure M4 is framed in the third field of intervention, DATA driven strategies and tools within the WP4, and it is the fourth measure in the urban node of Madrid.

CRTM is studying and testing some of the solutions and recommendations obtained within the multilevel governance and cooperation measure related with Mobility as a Service at regional level, “MaaS CRTM”. The main objective of this measure is to study and test a MaaS app in the Madrid region as a pilot in collaboration with the technology partner HaCon, who is in charge of developing the MaaS app.

In addition, as part of the technical integration of data coming from different mobility sources, ETRA has developed a new client oriented tool that facilitates data analytics and Big Data visualisation using the Madrid metropolitan area and its bus public transport (EMT) as a scenario. Knowing the flow of passengers between the areas in which the city is split into will help the transport company about when and where more service buses will be needed to better cover the citizens' needs.

3.3.2 Status

Regular meetings are taking place between CRTM, HaCon and Siemens Rail Automation (Siemens Mobility) to prepare the pilot MaaS app. Siemens Mobility is acting as Linked Third Party of HaCon as technology provider and contributes with defined R&D activities to the implementation of M4 and M8. The three entities are still analysing and studying factors to be considered in the development of the app:

- Analysing the public transport data (static and real time),
- Analysing the possible technological innovations for mobility management and use of P&R and



- defining of the KPIs that will be used during the monitoring phase.

Furthermore, a survey has already been carried out in collaboration with UPM to find out the behaviour of potential MaaS users.

On the other hand, the new tool for Big Data visualisation has already been developed by ETRA. At this moment, the tool is fed by synthetic data instead of real Origin-Destination data of flow of passengers. Due to technical problems EMT is facing to get this information. Nevertheless, the traffic flow data used tried to depict as much as possible real situations such as massive passenger movements in rush hours or different behaviour on weekends.

3.3.3 Risks found and corrective actions performed

Regarding the pilot test of the MaaS app, everything is progressing according to plan. There are some difficulties in integrating some Public Transport (PT) operators into MaaS but discussions are underway to resolve this.

On the other hand, to avoid delays in the development of the Big Data visualisation tool, synthetic data was used to initially feed the tool while the real data in the format of Origin-Destination matrices is pending.

3.3.4 Preliminary results

The MaaS app is still under development, so for this part of the M4 there are no results to show yet.

The new tool for the Big Data visualisation developed by ETRA is based on an open-source framework developed by UBER named KeplerGL. The library displays the historical mobility flow of EMT passengers between the different zones in the FUA level of Madrid allowing to filter the massive data according to specific parameters such as type of day (working day or holiday), type of weather (hot, warm, cold or rain), day of the week (from Monday to Sunday), and date/time range by selecting the specific inputs.

The data visualisation is available over a background map depicting quantitative arcs representing the traffic flow of passengers between the metropolitan Madrid districts (previously defined by CRTM), which are also represented quantitatively through 3D polygons. These arcs are shown with different stroke widths indicating visually the more or less quantity of users that travel from one zone to the others (see Figure 4).





Figure 4. Arcs in the Big Data visualisation tool.

Apart from the map, it is also possible to use interactive diagrams such as the Chord and HeatMap charts (Figure 5 and Figure 6), to facilitate the analysis of the massive data depicted.

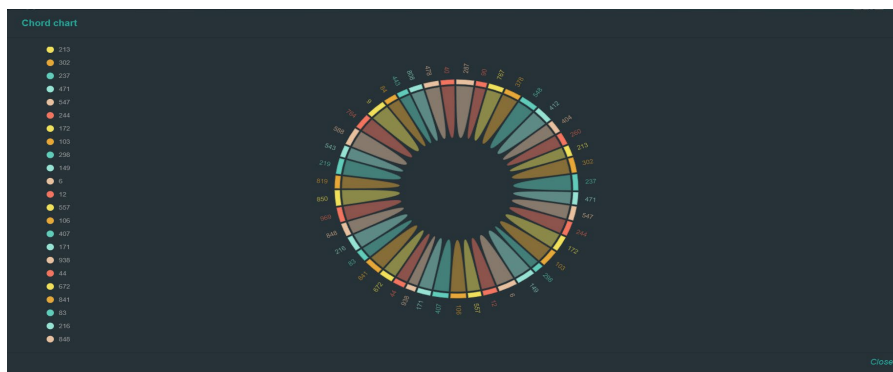


Figure 5. Chord chart of the Big Data visualisation tool.

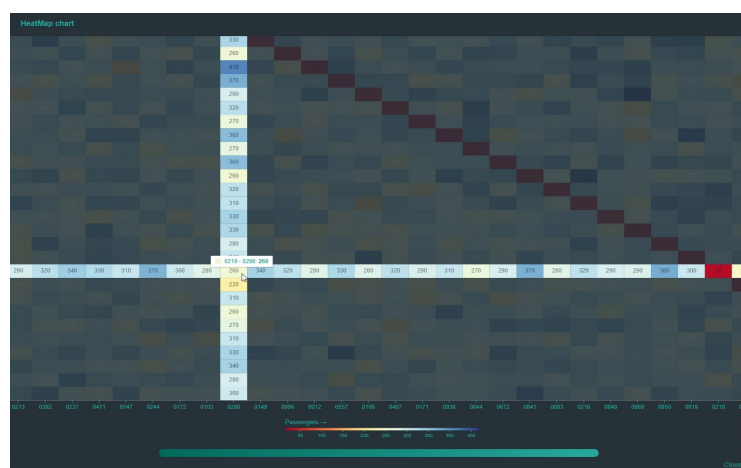


Figure 6. HeatMap chart of the Big Data visualisation tool.

3.3.5 Next steps

The next steps in the CRTM-Hacon app development will be the integration of the PT operators, which is still under negotiation. Once they are included, a pilot test will be carried out next year 2023 on two of the busiest corridors in the Madrid region.

Regarding the Big Data visualization, the next step will be to feed the tool with real data users traffic flow with the ticketing information coming from EMT and afterwards monitor it.

3.4 T4 – Creating a mobility portal combining personal transportation and logistics

In this measure, the city of Turku pilots a mobility portal developed by Vinka combining sharing of capacity of personal transportation and logistics on one platform, demonstrating the possibilities to combine freight movements. Through the measure, different combination possibilities of different service providers are simulated, tested and analysed. Based on the lessons learnt and their feasibility, the outcomes are applied in the planning of the logistic and personal transportation within the city of Turku and possibly also on the regional level.

3.4.1 Context

The measure has two main outputs:

- Scenarios identifying the potential of different transport combinations
- Mobility portal available for local businesses and operators

For the scenarios the city of Turku provides data on its current transportations and identifies potential use cases. Vinka's role is to analyse, simulate and finally showcase different scenarios on which operations could be combined and the measurable benefits it would bring. For the mobility portal Vinka provides a platform for fleet orchestration, service aggregation and operator management. The city of Turku will act as a facilitator for business which is especially important to small fleet operators and individual entrepreneurs.

TUAS will support the measure by sharing knowledge on previous projects on city logistics and facilitate cooperation with suitable courses on logistics, IT etc.



3.4.2 Status

During the reporting period a comprehensive catalogue has been compiled including information on current contracts between the city and operators. The catalogue was made to identify the most potential transportations for the scenario work. However, as all the services are contracted separately and operated by the service providers individually, it has been difficult to get the actual data for Vinka to analyse. After many contacts and discussions two interesting data sets are available for the measure. The first one contains data on the transportation of disabled people and the second one data on material transportation of the city. All the data analysed in the project will be made anonymous.

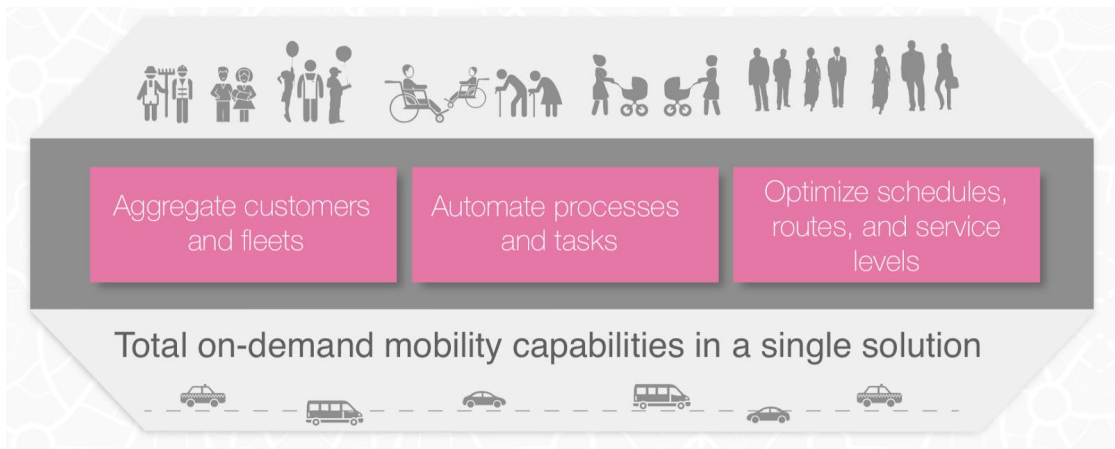
Turku and Southwest Finland are in the middle of regional healthcare reform, and it has an impact on the measure as well. As all the healthcare operations of the city will be centralised to the new organisation in the beginning of 2023, none of the related transportation will be procured by the city. Therefore, the potential cooperation with the new regional healthcare organisation is a precondition for getting sufficient data for the measure. Still, the city's procurement services have been keen to cooperate with the measure as the regional reform gives them an opportunity to renew their internal operations.

The portal development has focused around three topics:

1. Enabling the operation of different mobility and logistics services with different operative parameter setups (for customer service and fleet usage) simultaneously. This includes implementing and documenting the APIs for multi-service environments.



From silos...



...to one portal for several mobility and logistics services.

Figure 7. From silos to one portal.

2. Incrementing support for role-based user management which allows fleet operators to maintain their own fleet and company data and offering basic reporting tools for monitoring business in real time.
3. Implementing support for maintaining and operating hybrid services which position between scheduled public transport and on-demand mobility and last-mile logistics.

The initial version of the portal has been successfully tested and is soon ready to be implemented on the scale-up site. The Flex tool developed for maintaining and planning flexible services is at the end of initial development and test cycle.

3.4.3 Risks found and corrective actions performed

Table 1 -Risk Table for the measure T4.

Risks found	Corrective actions performed
Quantity of data sources falls short	Cooperation with the new regional healthcare organisation
Getting local businesses and operators to the portal.	The portal is actively communicated particularly to small companies and operators. Lessons learnt from previous logistic projects are explored and exploited.

Securing the development of the portal	Discussing the future need for the portal with regional organisations and identifying potential business models.
The quality of the data sources	Close cooperation with data owners.

3.4.4 Preliminary results

- Collection of data sets for the scenarios has been difficult as the data is not centrally collected.
- The different departments of the city are interested in the cooperation, as well as the new regional healthcare organisation.
- Requirements for the portal have been listed and competitors with partly similar ideas identified. Demo version will be available in November 2022.

3.4.5 Next steps

The scenario work continues with selected pilot cases and the first internal demonstration of the portal has been scheduled and the portal is ready for demonstrations in December 2022. The need for further development will be decided based on the feedback from the demonstration and the selection of the simulation and pilot use cases.

3.5 T5 – Implementing a real time regional mobility data platform

In this measure an online mobility data platform is designed, implemented and marketed for the users as part of the Service map of the city of Turku. The service map of the city was launched at the end of 2020, but was not yet in use in 2021 due to needed accessibility updates.

3.5.1 Context

The mobility data platform, i.e. mobility map, will be done using open source code and can therefore be scaled up easily. In the first stage the data will cover the city



of Turku and after that will be enlarged to the Southwest Region of Turku. The city of Turku has actively opened data sets and now these will be displayed on this new map. The Mobility map aims to showcase real time data on a variety of mobility and transport topics, such as parking places, maintenance information especially during the winter time, construction works, traffic flows, train, plane and cruise traffic, and weather conditions.

In addition to real time data, this map shows the historic development for example on cycling measurement points in the city. A specific focus of this measure is to use the developed mobility map in connection with event guidance and during exceptional circumstances. An important part of the measure is the marketing and integration of the mobility map to a variety of communication channels (public and private).

3.5.2 Status

In the measure T5 a large data-analysis was carried out of the data sources for the mobility part during summer 2021 and a service design was carried out for the mobility platform in autumn 2021. The Mobility data platform was decided to be named as a mobility map as that is more user friendly. During summer 2021 and summer 2022 several trainees worked on the mobility data sources to digitise some mobility sources and improve the quality of the data for the platform.

Thanks to the active work the Service map of the city of Turku with the mobility map as part of it was launched to the public in April 2022. Since then, there has been four updates with more data sources (June, August, October and November 2022). The information is provided in three languages – Finnish, Swedish and English.

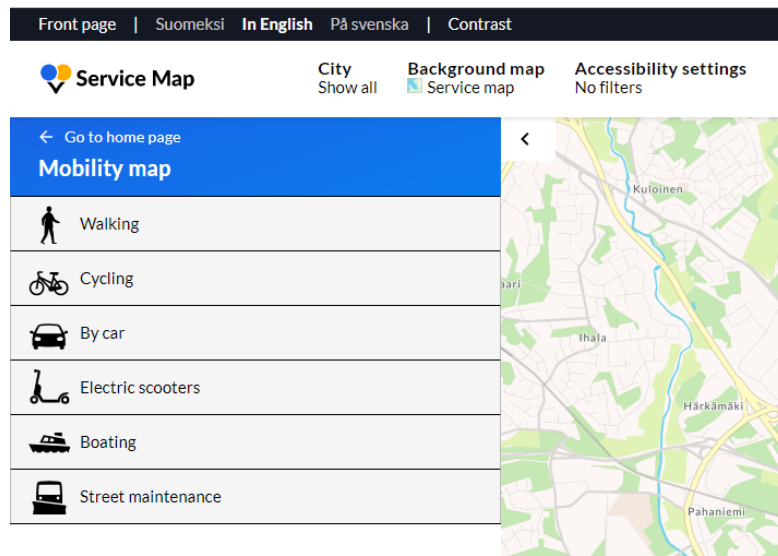


Figure 8. Mobility map of the city of Turku (4.11.2022) with current transport headlines at <https://palvelukartta.turku.fi/en/mobility>.

An accessibility analysis on the mobility map was carried out during summer 2022 for the map and corrections were carried out according to the analysis.

3.5.3 Risks found and corrective actions performed

Table 2 -Risk Table for measure T5

Risks found	Corrective actions performed
Getting users to the portal. How to avoid the information overload?	The mobility map is integrated into the city's communication. The user focus is clearly kept in mind and also the different service designs ensure this.
Securing financing for the future development of the portal	Putting efforts on communication to the leadership and showcasing the benefits of the mobility map.
The quality of the data sources is a challenge as dealing with multi-operator information	Improving the data sources and trying to find backend solutions that work for the majority of the solutions.

3.5.4 Preliminary results

- The mobility layer of the service map has been done using open source code and the produced codes can be found in:
 - GitHub - City-of-Turku/smbackend: Service Map backend
 - GitHub - City-of-Turku/servicemap-ui: The Service Map UI
- The data from the measure T3 Parking hub has been integrated into the mobility map. Negotiations with others are ongoing.
- Until 1.11.22 ten different mobility service/data providers data are visible on the mobility map through APIs (Ryder, Citynomad, Gasum Ltd, DigiTraffic, Donkey Republic, 24Rent, Helsinki, Lounaistieto, Infrafoad, YIT).
- Users have found the mobility map. User statistics (individual users): 1587/June 2022, 1267/July 2022, 1381/August 2022, 1113/September 2022.
- 10 different media bulletins on the mobility map have been done (social media posts, press releases, Turkuposti-news articles etc) in Finnish, Swedish and English. Beyond this, the mobility map has been linked to various pages on the Turku.fi website, in an effort to link its functions to information related to mobility services in Turku.
- Different data sources need a lot of work as the quality of the data is not as high as it should be, and the formats of the data require harmonisation.
- A lot of work needs to be done in order to fulfil the accessibility requirements of the maps.

3.5.5 Next steps

The next steps for the T5 measure include following:

- Adding more content to the mobility map. The next focus is on exceptional circumstances on the roads and on integrating the regional data sources to the platform.
- Adding more mobility service providers data to the mobility map.
- A master thesis on the service design of the mobility data platform will be ready and the results of it will be considered in further planning of the measure.
- Getting user feedback on the mobility map for the evaluation.
- Integrating the data from the T6 activation model to the map.
- Increasing the marketing of the portal and integration of the portal to other websites.



4 Conclusions

In this document the background of the WP4 and how it relates to the different measures selected for implementation in SCALE-UP has been described. The relation of the WP4 DATA in its concept, objectives and expected outcomes, as well as in its more practical aspects such as its relation with other project activities and measures in general has also been given a brief overlook.

WP4 DATA explores the digital layer; one of the layers of the multi-layered mobility solution that is one of the foundations of SCALE-UP and is thus a key in the horizontal upscaling strategies that are the object of WP1. On the other hand, collection of data, processing of data, related processes such as operative interactions between stakeholders and service and data providers, securing and protecting private data, or how information is provided in the most meaningful and concise way to users are also aspects that are under the scope of WP4. And several of these aspects have relevance in almost all of the measures being implemented in SCALE-UP -not just those identified under WP4- which once again underlines the importance of the WP4 DATA concepts and adequate development within the project.

In general, all of the measures under WP4 are progressing adequately, being now in the early demonstration or final preparation phases. Perhaps the most interesting outcome of the implementation of the measures at this point is the identification of the different challenges and the different solutions that have been proposed by the cities to overcome these challenges.

The main challenges encountered by the cities in the implementation of the measures are:

- Service providers and mobility operators are reluctant to share data.
- The difficulty of integrating all data from different operators on a single platform.
- Data collection environment is in itself sometimes challenging due to its decentralised nature, whether in a private-public schema, or within a public-public structure.
- Data exchange formats vary according to different parameters, so integration of information in a single platform is difficult.
- In some cases, data collection itself -no data providers, no data sources yet- is problematic.



- In mobility and freight scenarios, there can be a large amount of data available for the users. Adequate visualisation is a key aspect for the users.
- The development of some of the measures' components requires testing with mobility data. Real data is not always available, so there is a need to use existing datasets. However, this creates a dependency on how these datasets were collected and what was the purpose for their collection, if any. Whenever possible, real data as close as possible to that of the real environment of the solution should be used.

As some of the challenges are of a technical nature, and others have more to do with organisational or operational aspects, cities are addressing both when approaching the challenges. The final goal will always be to raise awareness on the benefits of sharing data, and to provide the tools and mechanisms to ensure the quality, integrity and validity of data for the purposes of the measures being implemented.

It should be noted that bi-lateral meetings and thematic cooperation meetings have been useful mechanisms to provide a direct feedback loop from the cities to raise awareness of specific challenges and issues and openly discuss potential workarounds with developers and measure teams' members from other cities. As the implementation of the measures advances, it is also to be expected that these exchanges, with more experience, will produce more relevant outcomes for WP4 and for the project.

With the WP4 measures being relatively advanced in implementation, local teams are getting a more accurate representation of what needs to be done to complete the implementation of the measures. The next steps described by the cities reflect this state, with actions being mostly focused on completing integration, complete acquisition of data sources, and advancing on standardisation, data processing and visualisation tools.